Kramer Electronics, Ltd.

USER MANUAL

Model:

TP-43

Component – S/PDIF Transceiver

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1 Introduction

Welcome to Kramer Electronics! Since 1981, Kramer Electronics has been providing a world of unique, creative, and affordable solutions to the vast range of problems that confront the video, audio, presentation, and broadcasting professional on a daily basis. In recent years, we have redesigned and upgraded most of our line, making the best even better! Our 1,000-plus different models now appear in 11 groups[1] that are clearly defined by function.

Thank you for purchasing your Kramer TOOLS **TP-43** *Component – S/PDIF Transceiver*, which is designed to be used with the **TP-41** *Component – S/PDIF transmitter* and the **TP-42** *Component – S/PDIF receiver*. The **TP-43** uses existing UTP cabling that results in an efficient, fast and uncluttered environment for:

- High-quality home cinema at multiple outputs
- Studios, airports, offices and hospitals
- Security and military applications

Each package includes the following items:

- The **TP-43** *Component – S/PDIF Transceiver*
- Power supply
- This user manual[2]

2 Getting Started

We recommend that you:

- Unpack the equipment carefully and save the original box and packaging materials for possible future shipment
- Review the contents of this user manual
- Use Kramer high-performance high-resolution cables[3]

1 GROUP 1: Distribution Amplifiers; GROUP 2: Switchers and Matrix Switchers; GROUP 3: Control Systems; GROUP 4: Format/Standards Converters; GROUP 5: Range Extenders and Repeaters; GROUP 6: Specialty AV Products; GROUP 7: Scan Converters and Scalers; GROUP 8: Cables and Connectors; GROUP 9: Room Connectivity; GROUP 10: Accessories and Rack Adapters; GROUP 11: Sierra Products

2 Download up-to-date Kramer user manuals from our Web site at http://www.kramerelectronics.com

3 The complete list of Kramer cables is on our Web site at http://www.kramerelectronics.com

3 Overview

The **TP-43** *Component – S/PDIF Transceiver* receives a twisted pair CAT 5 signal, decodes it and simultaneously distributes it to the YUV and S/PDIF outputs, as well as relaying the input to the next receiver (transceiver operation). In particular, the **TP-43** *Component – S/PDIF Transceiver* features:

- A YUV[1] output on 3 RCA connectors
- A digital audio output (S/PDIF) on an RCA connector
- A CAT 5 input and output on RJ-45 connectors
- Individual level and EQ. controls for the Y, U, and V signals, as well as audio level and EQ. controls

The **TP-43** *Component – S/PDIF Transceiver* is designed to be used with the **TP-41** and the **TP-42**. When using three **TP-43** units between the **TP-41 / TP-42** pair, the maximum range of the system via UTP cabling can be extended to up to 1200ft (400m).

Kramer twisted pair adapters are an excellent way to solve remote monitoring requirements without using more costly coaxial cable or fiber, or wireless transmission systems.

To achieve the best performance:

- Use only good quality connection cables[2] to avoid interference, deterioration in signal quality due to poor matching, and elevated noise levels (often associated with low quality cables).
- Avoid interference from neighboring electrical appliances that may adversely influence signal quality and position your Kramer TP-43 away from moisture, excessive sunlight and dust

Caution – No operator-serviceable parts inside unit.

Warning – Use only the Kramer Electronics input power wall adapter that is provided with this unit[3].

Warning – Disconnect power and unplug unit from wall before installing or removing device or servicing unit.

1 Also known as Y, B-Y, R-Y, or Y, Pb, Pr

2 Available from Kramer Electronics on our Web site at http://www.kramerelectronics.com

3 For example, part number 2535-000251

3.1 Shielded Twisted Pair (STP) / Unshielded Twisted Pair (UTP)

We recommend that you use shielded twisted pair (STP) cable. There are different levels of STP cable available, and we advise you to use the best quality STP cable that you can afford. Our STP skew-free cable, Kramer **BC-SXTP**, is intended for transmitting VGA signals. Our non-skew-free cable, Kramer **BC-STP,** is intended for digital signals.
The compliance to electromagnetic interference was tested using STP cables, therefore we recommend using those cables.

Although unshielded twisted pair (UTP) cable might be preferred for long range applications, the UTP cable should be installed far away from electric cables, motors and so on, which are prone to create electrical interference. However, since the use of UTP cable might cause inconformity to electromagnetic standards, Kramer does not commit to meeting the standard with UTP cable.

4 Your TP-43 Component – S/PDIF Transceiver

For a description of the **TP-43** *Component – S/PDIF Transceiver*:

- Topside, see section 4.1
- Underside, see section 4.2

4.1 Your TP-43 Component – S/PDIF Transceiver

Figure 1, *Figure 2*, *Figure 3*, and *Table 1* define the **TP-43**:

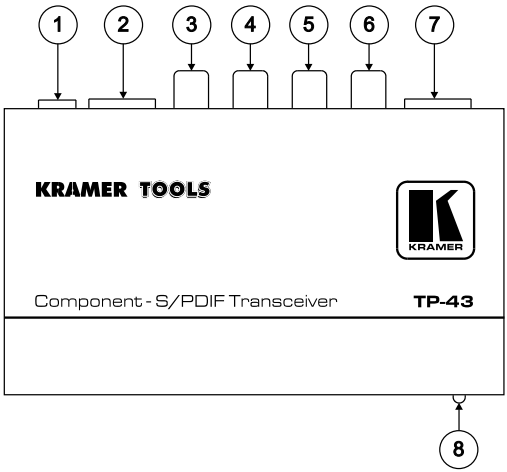


Figure 1: TP-43 Component – S/PDIF Transceiver

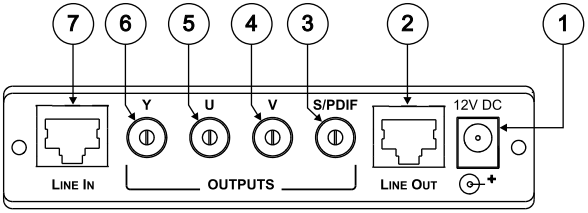


Figure 2: TP-43 Component – S/PDIF Transceiver

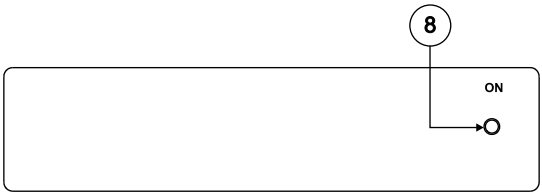


Figure 3: TP-43 Component – S/PDIF Transceiver

Table 1: TP-43 Component – S/PDIF Transceiver Features

#	Feature		Function
1	*12V DC*		+12V DC connector for powering the unit
2	*LINE OUT* RJ-45 Connector		Connects to the *LINE IN* connector on the **TP-42**[1]
3	OUTPUTS	*S/PDIF* RCA Connector	Connects to the digital audio acceptor
4		*V* RCA Connector	Connects to the component video acceptor
5		*U* RCA Connector	
6		*Y* RCA Connector	
7	*LINE IN* RJ-45 Connector		Connects to the *LINE OUT* connector on the **TP-41**[1]
8	*ON LED*		Illuminates when receiving power

1 Using a straight pin to pin UTP or STP cable with RJ-45 connectors at both ends (the PINOUT is defined in *Table 3* and *Figure 7*)

4.2 Your TP-43 Component – S/PDIF Transceiver Underside

Figure 4 and *Table 2* define the underside of the **TP-43**:

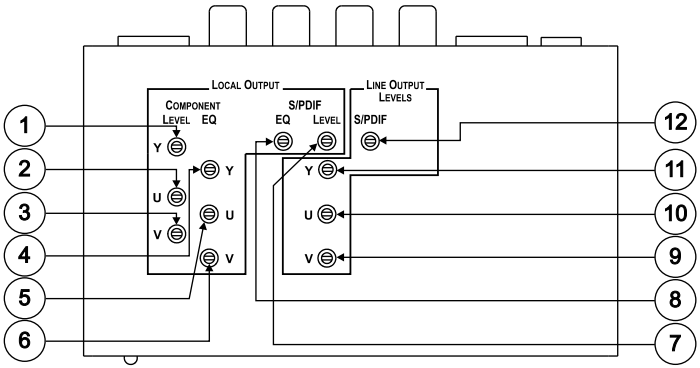


Figure 4: TP-43 Component – S/PDIF Transceiver Underside

Table 2: TP-43 Component – S/PDIF Transceiver Underside Features

#	Feature				Function
1	LOCAL OUTPUT	COMPONENT	LEVEL	Y Trimmer	Adjusts[1] the Y output signal level
2				U Trimmer	Adjusts[1] the U output signal level
3				V Trimmer	Adjusts[1] the V output signal level
4			EQ.	Y Trimmer	Adjusts[1] the cable compensation equalization level for output Y
5				U Trimmer	Adjusts[1] the cable compensation equalization level for output U
6				V Trimmer	Adjusts[1] the cable compensation equalization level for output V
7		S/PDIF	LEVEL		Adjusts[1] the digital audio signal level
8			EQ.		Adjusts[1] the digital audio output cable compensation equalization level
9	LINE OUTPUT LEVELS		V Trimmer		Adjusts[1] the V line output signal level
10			U Trimmer		Adjusts[1] the U line output signal level
11			Y Trimmer		Adjusts[1] the Y line output signal level
12			S/PDIF Trimmer		Adjusts[1] the S/PDIF digital audio line output signal level

5 Connecting the TP-43 Component – S/PDIF Transceiver

This section describes how to connect:

- The **TP-43**, see section 4.1
- An extended Component – S/PDIF distribution system by connecting three **TP-43** units between the **TP-41** and the **TP-42**, see section 4.2

1 Insert a screwdriver into the small hole and carefully rotate it, trimming the level

5.1 Connecting a TP-43 Component – S/PDIF Transceiver

To configure a **TP-43** *Component – S/PDIF Transceiver*, as the example in *Figure 5* illustrates, do the following:

1. Connect the:
   - Y, U, and V RCA (component video) OUTPUT connectors to a component acceptor (for example, a plasma display)
   - S/PDIF (digital audio) RCA OUTPUT connector to an AV Receiver
2. Connect the *LINE IN* connector of the **TP-43** to the *LINE OUT* connector of the **TP-41**, via UTP cabling (maximum range of 300ft (100m)).
3. Connect the *LINE OUT* connector of the **TP-43** to the *LINE IN* connector of the **TP-42**, via UTP cabling (maximum range of 300ft (100m)).
4. Connect a 12V DC power adapter to the power socket and connect the adapter to the mains electricity (not shown in *Figure 5*).
5. If necessary, adjust[1] the appropriate level(s) of the **TP-43**, the:
   - Local output: Y, U and V signal levels, Y, U and V compensation equalization levels, and the digital audio S/PDIF level and compensation equalization level
   - Line output: Y, U and V signal levels, and the digital audio S/PDIF level

1 Insert a screwdriver into the small hole and carefully rotate it, trimming the level

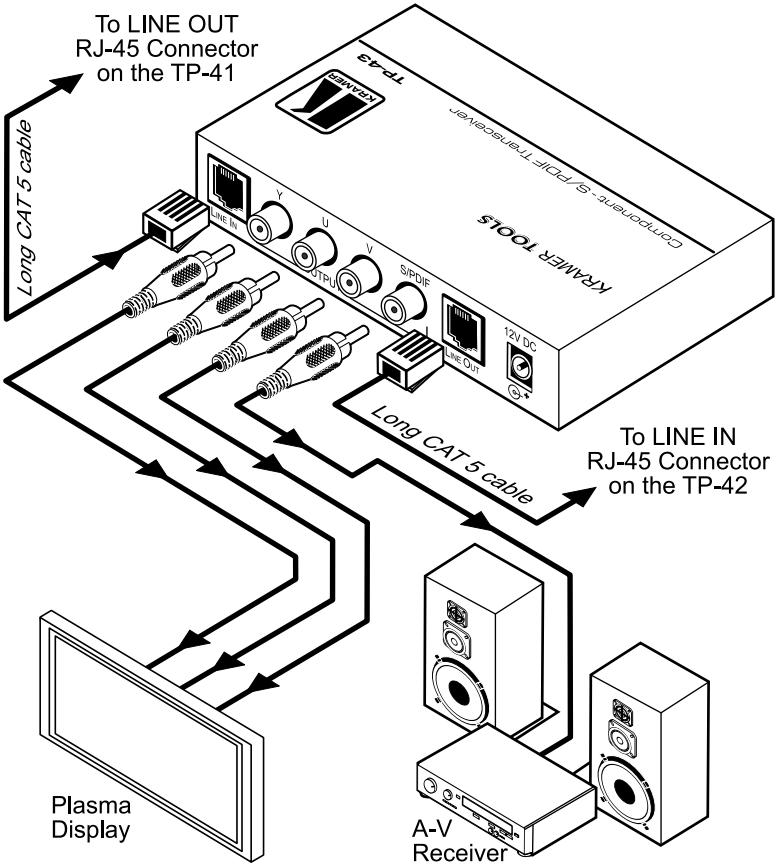


Figure 5: Connecting the TP-43 Component – S/PDIF Transceiver

5.2 Connecting an Extended Component – S/PDIF Distribution System

To configure a **TP-41 / TP-42 / TP-43** extended Component – S/PDIF distribution system (up to 1200ft (400m)), as the example in *Figure 6* illustrates:

1. On the **TP-41**, connect the:
   - Y, U, and V RCA INPUT connectors and the S/PDIF (digital audio) RCA INPUT connector to a component source (for example, a DVD player)
   - *LINE OUT* connector[1] to the *LINE IN* connector[1] of the first **TP-43**
2. On the first **TP-43**, connect the:
   - Local Output A: Y, U, and V RCA (component video) OUTPUT connectors to a component acceptor (for example, a plasma display), and the S/PDIF (digital audio) RCA OUTPUT connector to an AV Receiver
   - *LINE OUT* connector[1] to the *LINE IN* connector[1] of the second **TP-43**
3. On the second **TP-43**, connect the:
   - Local Output B: Y, U, and V RCA (component video) OUTPUT connectors to a component acceptor (for example, a plasma display), and the S/PDIF (digital audio) RCA OUTPUT connector to an AV Receiver
   - *LINE OUT* connector[1] to the *LINE IN* connector[1] of the third **TP-43**
4. On the third **TP-43**, connect the:
   - Local Output C: Y, U, and V RCA (component video) OUTPUT connectors to a component acceptor (for example, a plasma display), and the S/PDIF (digital audio) RCA OUTPUT connector to an AV Receiver
   - *LINE OUT* connector[1] to the *LINE IN* connector[1] of the **TP-42**

1 Via CAT 5 cabling with a maximum range of up to 300ft (100m)

5. On the **TP-42**, connect the:
   - Y, U, and V RCA (component video) OUTPUT connectors to a component acceptor (for example, a plasma display), and the S/PDIF (digital audio) RCA OUTPUT connector to an AV Receiver
6. On each unit, connect a 12V DC power adapter to the power socket and connect the adapter to the mains electricity (not shown in *Figure 6*).
7. If necessary, adjust[1] the appropriate level(s) on the **TP-41**[2], the **TP-42**[3] and on each of the three **TP-43** units[4].

1 Insert a screwdriver into the small hole and carefully rotate it, trimming the level

2 That is, the audio level and the Y, U, and V levels

3 That is, the audio level, the audio EQ., the Y, U, and V levels, and the Y, U, and V EQ.

4 That is, the local output: Y, U and V signal levels / compensation equalization levels, and the digital audio S/PDIF level and compensation equalization level, as well as the line output: Y, U and V signal levels, and the digital audio S/PDIF level

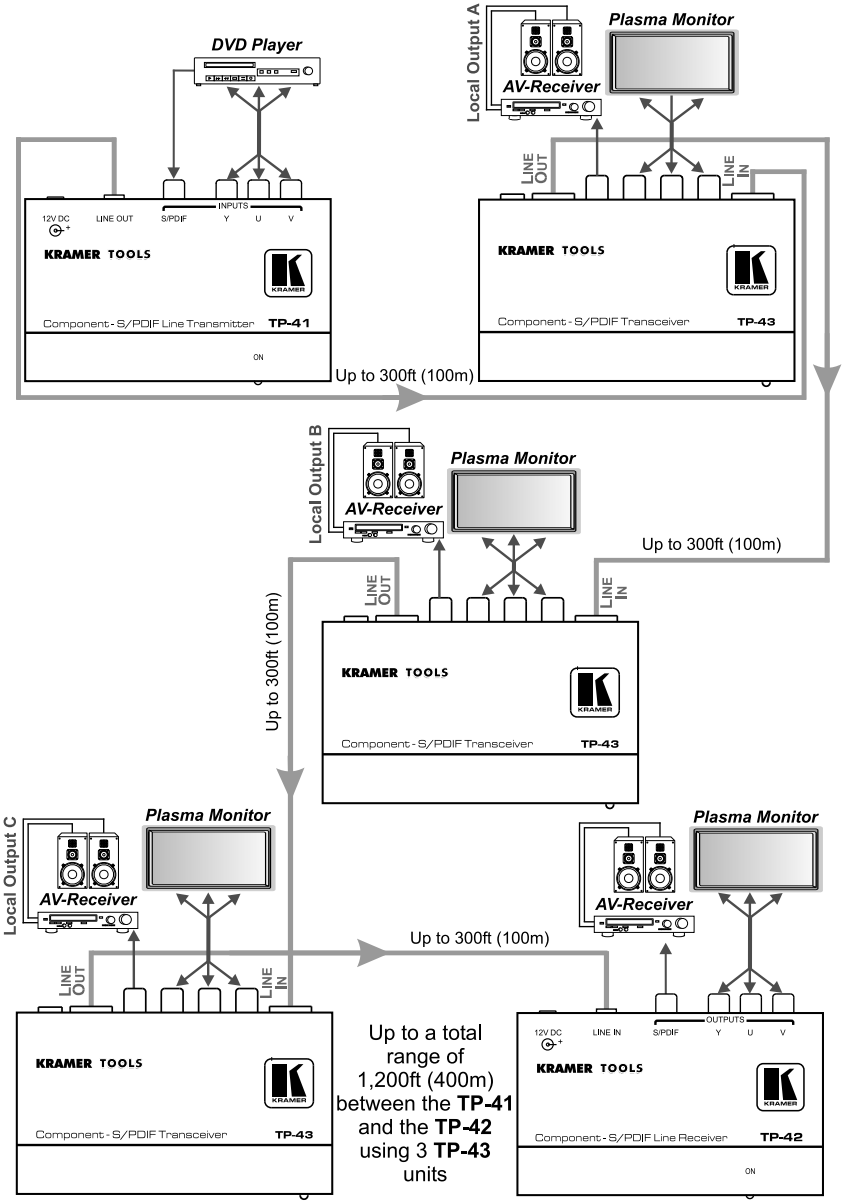


Figure 6: Configuring an Extended Component – S/PDIF Distribution System

5.3 Wiring the CAT 5 LINE IN / LINE OUT RJ-45 Connectors

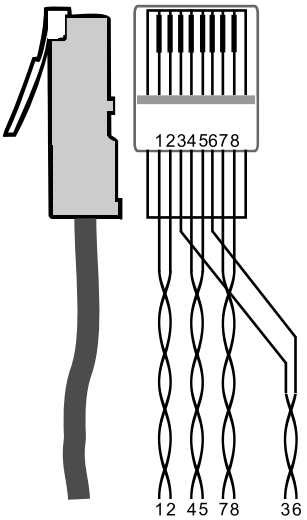
Table 3 and *Figure 7* define the CAT 5 PINOUT, using a straight pin-to-pin cable with RJ-45 connectors:

Table 3: CAT 5 PINOUT

EIA /TIA 568A	
PIN	**Wire Color**
1	Green / White
2	Green
3	Orange / White
4	Blue
5	Blue / White
6	Orange
7	Brown / White
8	Brown
Pair 1	4 and 5
Pair 2	3 and 6
Pair 3	1 and 2
Pair 4	7 and 8

EIA /TIA 568B	
PIN	**Wire Color**
1	Orange / White
2	Orange
3	Green / White
4	Blue
5	Blue / White
6	Green
7	Brown / White
8	Brown
Pair 1	4 and 5
Pair 2	1 and 2
Pair 3	3 and 6
Pair 4	7 and 8

Figure 7: CAT 5 PINOUT



6 Technical Specifications

Table 4 defines the technical specifications[1]:

Table 4: Technical Specifications[2] of the TP-43

INPUTS:	1 RJ-45 CAT 5 shielded connector (LINE IN)	
OUTPUTS:	Local Output	1 set of component video (Y, U, V) on RCA connectors 1 S/PDIF (digital audio) on an RCA connector
	Repeater Line Output	1 RJ-45 CAT 5 shielded connector (LINE OUT)
MAX. OUTPUT LEVEL:	2Vpp (video and audio)	
RESOLUTION:	Video: Up to 1080i	Audio: S/PDIF up to 192kHz
DIFF. GAIN:	0.15%	
DIFF. PHASE:	1.05 Deg[3] / 0.68 Deg[4]	
K-FACTOR:	0.1%	
S/N RATIO:	Video: 72dB	
CROSSTALK (all hostile):		Audio: –46dB S/PDIF into video@5MHz
CONTROLS:	Video Line Out Level: –1.1dB to +1.4dB Video Level Out: –0.9dB to +0.83dB S/PDIF Line Out Level: –1.6dB to +0.9dB S/PDIF Level Out: –0.82dB to +0.8dB EQ. at TP 43 OUT: 0 to +4.1dB video @ 33MHz 0 to +3dB S/PDIF @ 33MHz (60m)	
COUPLING:	Video: DC	Audio: DC
POWER SOURCE:	12V DC, 139mA	
DIMENSIONS:	12cm x 7.15cm x 2.76cm (4.7" x 2.8" x 1.08") W, D, H	
WEIGHT:	0.3 kg (0.67 lbs.) approx.	
ACCESSORIES:	Power supply	

1 Specifications for CAT 5 UTP cable 60m (TP-41 to TP-43) and 30m (TP-43 to TP-42), unless otherwise specified

2 Specifications are subject to change without notice

3 Repeater section

4 Local output

LIMITED WARRANTY

Kramer Electronics (hereafter *Kramer*) warrants this product free from defects in material and workmanship under the following terms.

HOW LONG IS THE WARRANTY

Labor and parts are warranted for seven years from the date of the first customer purchase.

WHO IS PROTECTED?

Only the first purchase customer may enforce this warranty.

WHAT IS COVERED AND WHAT IS NOT COVERED

Except as below, this warranty covers all defects in material or workmanship in this product. The following are not covered by the warranty:

1. Any product which is not distributed by Kramer, or which is not purchased from an authorized Kramer dealer. If you are uncertain as to whether a dealer is authorized, please contact Kramer at one of the agents listed in the Web site www.kramerelectronics.com.
2. Any product, on which the serial number has been defaced, modified or removed, or on which the WARRANTY VOID IF TAMPERED sticker has been torn, reattached, removed or otherwise interfered with.
3. Damage, deterioration or malfunction resulting from:
   i) Accident, misuse, abuse, neglect, fire, water, lightning or other acts of nature
   ii) Product modification, or failure to follow instructions supplied with the product
   iii) Repair or attempted repair by anyone not authorized by Kramer
   iv) Any shipment of the product (claims must be presented to the carrier)
   v) Removal or installation of the product
   vi) Any other cause, which does not relate to a product defect
   vii) Cartons, equipment enclosures, cables or accessories used in conjunction with the product

WHAT WE WILL PAY FOR AND WHAT WE WILL NOT PAY FOR

We will pay labor and material expenses for covered items. We will not pay for the following:

1. Removal or installations charges.
2. Costs of initial technical adjustments (set-up), including adjustment of user controls or programming. These costs are the responsibility of the Kramer dealer from whom the product was purchased.
3. Shipping charges.

HOW YOU CAN GET WARRANTY SERVICE

1. To obtain service on you product, you must take or ship it prepaid to any authorized Kramer service center.
2. Whenever warranty service is required, the original dated invoice (or a copy) must be presented as proof of warranty coverage, and should be included in any shipment of the product. Please also include in any mailing a contact name, company, address, and a description of the problem(s).
3. For the name of the nearest Kramer authorized service center, consult your authorized dealer.

LIMITATION OF IMPLIED WARRANTIES

All implied warranties, including warranties of merchantability and fitness for a particular purpose, are limited in duration to the length of this warranty.

EXCLUSION OF DAMAGES

The liability of Kramer for any effective products is limited to the repair or replacement of the product at our option. Kramer shall not be liable for:

1. Damage to other property caused by defects in this product, damages based upon inconvenience, loss of use of the product, loss of time, commercial loss; or:
2. Any other damages, whether incidental, consequential or otherwise. Some countries may not allow limitations on how long an implied warranty lasts and/or do not allow the exclusion or limitation of incidental or consequential damages, so the above limitations and exclusions may not apply to you.

This warranty gives you specific legal rights, and you may also have other rights, which vary from place to place.

NOTE: All products returned to Kramer for service must have prior approval. This may be obtained from your dealer.

This equipment has been tested to determine compliance with the requirements of:

EN-50081:	"Electromagnetic compatibility (EMC); generic emission standard. Part 1: Residential, commercial and light industry"
EN-50082:	"Electromagnetic compatibility (EMC) generic immunity standard. Part 1: Residential, commercial and light industry environment".
CFR-47:	FCC* Rules and Regulations: Part 15: “Radio frequency devices Subpart B Unintentional radiators”

CAUTION!

- Servicing the machines can only be done by an authorized Kramer technician. Any user who makes changes or modifications to the unit without the expressed approval of the manufacturer will void user authority to operate the equipment.
- Use the supplied DC power supply to feed power to the machine.
- Please use recommended interconnection cables to connect the machine to other components.

* FCC and CE approved using STP cable (for twisted pair products)

For the latest information on our products and a list of Kramer distributors, visit our Web site: www.kramerelectronics.com where updates to this user manual may be found.
We welcome your questions, comments and feedback.

Safety Warning:
Disconnect the unit from the power supply before opening/servicing.

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P/N: 2900-000136 REV 2